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# E D I T O R I A L

**On these pages the editor offers his opinions, unshackled by advertising patrons and unrestrained by anything save a sense of the decent and the truthful. The editor, alone, is responsible for their type, their tone and their tenor.**

## BREAKING THE FAST

FOR the word breakfast, we may summon a host of definitions, and descriptive persiflage. One man's breakfast is another man's poison in quality and in quantity. And every man's breakfast is his own poison when consumed in the customary commuters' fashion. For in the whirligigs of our modern existence, it is often a various meal, shot like bullets down the gastronomic chute, rinsed with bibulous vigor, and settled into the gastric ridges by the hurried stamping of the breakfaster's feet outdoing each other in a frantic rush to catch a train, whose clinging, clawing passengers are packed in a smoker that reeks with more and worse smoke than ever pours from the engine's stack.

Benjamin Franklin, that delicious old moralist, and "don't do as I dooster", says somewhere in one of his essays—

"Disorder breakfasts with Plenty, dines with Poverty, sups with Misery and sleeps with Death."

That is not a pleasant division of the day, but whether Franklin meant it to be so or not, it does have a dietetic moral. For it is disorderly, unwise and unhealthy to break any fast with plenty.

Indeed it is unhealthy for the average person to gorge with any meal. Statistics and horse sense are agreed that more people commit suicide with the knife and fork than with any other implement or weapon.

Breakfast, the chemist informs me, should be a slim meal, with its component parts discriminately chosen, meticulously prepared and consumed, not hastily, but with that calm and classic contentment that wins complete digestive confidence.

For the stomach, laved and lazied overnight in its own tepid mucilage, is not too abruptly nor too strenuously to be awakened from its peptic torpor, but gently like the humming home of vagrant doves on the thin edge of morning.

And the morning stomach may be remembering the insult of the evening before and its ferment glands are still rebellious. Then there

are stomachs that wake up in the morning, as do many persons you and I know, with a grouch and a grunt and grumble.

Such stomachs may not deserve a discriminate breakfast, but for comfort's sake their owners should see that they get such. In other words it should be our endeavor to bring to the breakfast table a wide-awake brain but a thoroughly drowsy stomach.

Other prerequisites to breakfast happiness are a clean mouth and a quivering nose. Residues of dentifrice flavors, bitter memories of irium, or other tooth-cleaning atrocities, are absolutely unacceptable to breakfast organoleptic ecstasies. In other words, a clean mouth marks the beginning of a good breakfast.

The habit of drinking ice water before breakfast is not good. Indeed, drinking ice cold fluids is never good practice. The temperature of water and other body imbibitions was a matter of much concern with good old Dr. Wiley. Warm water before breakfast he favored, but ice water never. He strongly advised against the drinking of water, especially in hot weather, at a temperature lower than 50 degrees Fahrenheit. And so positive was he of the value of this advice that he crystallized his sentiment in song—

"Full many a dumb-bell, young and old,
Has gone to his gray sarcophagus
By pouring water icy cold
Adown his hot esophagus."

Then, too, let me advise all against pre-breakfast courtship of my lady Nicotine. Let me also tell you that the most recent studies of that careful worker, Dr. R. Pearl, definitely proves that tobacco, inordinately used, shortens, with dramatic precision, the span of human life—even more so than does the cocktail and its cantankerous kin.

Orange juice, a pint a day, carries sufficient anti-scorbutic vitamin C to provide all of it that an adult requires in that period, and orange juice is any breakfast's good beginning.

Of an acid, citric acid, alkalinized in its eventual body use, this pint of orange juice contains about 40 grains, and although this acid is, generally speaking, a benign and kindly chemical, it does affect the operation of certain elements in the body. The carbohydrates and the carminative flavors present in this very essential component of the modern breakfast are particularly appealing to the fasting stomach, and few morning appetites find fault with this invigorating juice.

which should be served cold but never ice cold, and never in quantities over a half pint at a sitting. It may be, if desired, zested with lemon juice, or preserved with the juice of the pineapple. Or it may be replaced, by those of strange preferences, with juice of the shattuck, which, in common parlance, is the grape fruit. In favor of orange juice, in still another direction I quote these few paragraphs from a scientific source:

"For that tired feeling—try orange juice."

No, it's not an advertisement, and for orange juice you can substitute any other fresh fruit or vegetable that contains plenty of anti-scurvy vitamin C. The list of such foods runs from apples and cabbages to tomatoes.

Of coffee, what can be said else than that it should be good, well prepared and ruined by neither cream nor sugar.

Toast is partly burnt bread, with the baked starch further changed to a line of digestible dextrins and dextroses, to say nothing of the charcoal. Toast is more readily digested than bread, and buttered toast is better by far, in point of taste and morning judgment, than the syrupy cinnamoned, case-hardened cakes served by some for breakfast.

Besides, toast is such an appropriate company for coffee. "Cast thy bread upon the waters"—states the Bible—but, says Allentown—"Dunk it", and the pasty-fingered epicure who never tasted toast tinctured in tepid coffee has never known a gastronomic thrill. The use of white bread, toasted or untoasted, is an indignity to good sense. White bread is made from an impoverished flour, whose vitamins and minerals are largely removed by processing and chemicalization. Here the staff of life is a broken reed. Far more nutritious is whole wheat or graham bread.

There are parts of Pennsylvania where pies are still served for breakfast, open-faced apple pie, sour cherry pies, plum pies and pumpkin pies. And when I remember those homely bulging, luscious pies of Pennsylvania, my heart goes out in sheer sympathy to those pasty production pies indigenous to Philadelphia—weary looking, undernourished pies, with the crust ashamed of the filling, and the filling ashamed of the crust.

But good or bad, lean or fat, pies are not for breakfast.

And with a gob of marmalade or any well-made preserves, breakfast should now be over, with ample time to start the car or catch the

train, or better than all if feasible—a leisurely walk to work. Unless the breakfasteer, anchored to tradition, insists on eggs.

And really eggs have been so long associated with the dietary and especially with breakfast, that we can scarcely pass them by without comment.

We have more than a hundred ways of preparing eggs. In the first place, there is a chronological angle to eggs that must not be overlooked. A fresh egg *is* superior, in cookability as well as in palatability, to an antique egg, and few of us like chicken meat well enough to want to eat it while it is still in the egg. Unless we are fortunate or discriminate buyers of eggs, which are greatly overrated in the dietary, few of us ever achieve to eggs whose proud mammas have not long since been served as chicken salad.

They may be soft boiled or coddled, hard boiled or pickled, fried —one eye opened, or totally blind—poached, scrambled, omeletted in several languages, the one prepared by the old Spanish custom being very popular hereabouts, despite the fact that when served it looks as if it had already been eaten once!

Of all forms, the soft-boiled egg and the fluffy omelette are most digestible, and this with actual experiment. Still, it is to be remembered that human stomachs are not standardized, nor as adjustable as are the engines of a certain vintage of Fords, although—watching the post-prandial paroxysms of certain persons, unhitching belts or wiggling in whalebone, one might think that the stroke and bore of a stomach were adjustable to something more than mere comfort. The diet of the standardized Ford is the standard gasoline, but the diet of man will ever be diversified.

By and large, stomachs are very erratic organs, and classic statements with respect to their functions must be taken, as eggs—*cum grano salis*.

More than we know does the gastric equipment react to mental stresses and distresses. The phlegmatic individual has a conservative stomach that is in no hurry to dump its contents into the bowel. The nervous, temperamental person owns a nervous, prima-donna pouch. Accordingly each of us, with eggs or any other food, should eat in accord with our particular or not so particular kind of a stomach.

But, asks a disappointed reader, what of the breakfast ham with the eggs, the well-broiled strips of bacon, the fried smoked bloater, or finnie haddock—the braised steak or the marinetted mackerel, and

the sausage and scrapple and buckwheat cakes—to which the answer is that this was a week-day breakfast, and that except for Sunday's leisurely brunch—that hybrid of breakfast and lunch—no sane man would even want more for breakfast than fruit juice, coffee and toast, and perhaps the occasional egg.

IVOR GRIFFITH.

## BIGGER AND BETTER BUBBLES

Soap bubbles and films, toughened and made long-lasting with glycerine, have found an important place in science and engineering, according to C. A. Cook, formerly of the Case School of Applied Science, Cleveland, Ohio. Writing in the *Journal of Chemical Education,* this authority points out that not only are soap bubbles of this kind used in laboratory demonstrations of explosive gases but that, "long-lived soap films have found application in engineering research on the torsional stresses, and the distribution of stresses in beams and other structural members of aircraft, bridges, machines, etc. This is because of a mathematical analogy between the torsion or stress of the member, and that of a membrane (such as a soap film) subjected to an excess of pressure on one side, as by compressed air". Scientists of the National Advisory Committee for Aeronautics, for example, have used this soap bubble analogy for research in machine and structural design of airplanes.

In these bubbles and films, glycerine because it is non-volatile and hygroscopic, maintains moisture and pliability, and also maintains the stability of these films against such factors as carbon dioxide, grease and any floating particles, such as dust.

Dr. Cook's formula follows: 30 grams of powdered castile soap or any good milled soap is placed in a 1 liter glass-stoppered bottle and distilled water is added to fill the bottle, which is shaken at intervals until solution is complete. It is then allowed to stand for twenty-four hours. The clearer portion is then siphoned off, and three-tenths of its volume of glycerine is added and thoroughly mixed with it. The solution should age for at least twenty-four hours before use, and should be kept in a well-stoppered bottle in a dark place. When it is desired to use some of it, about 25 cc. is poured out and stirred with a little tannin (25-100 mg.) before bubbles or films are blown.

With such glycerine-toughened soap solutions, bubbles lasting as long as 100 days and films lasting up to three years have been prepared in closed vessels.

# ORIGINAL ARTICLES

## OXALATE FORMATION IN ASCORBIC ACID SOLUTIONS

A. E. Jurist and W. G. Christiansen*

IT has been pointed out by several investigators including Ghosh, (1) that aqueous solutions of ascorbic acid and its salts are unstable, progressively losing ascorbic acid content on standing. Ghosh and Rakshit (2) pointed out that oxalic acid is one of the oxidation products of ascorbic acid. Maurer and Scheidt (3) stated that ferrous ascorbate solutions deposited ferrous oxalate crystals on standing, but neither described any mechanism by which this reaction could take place. In view of the interest there has been from time to time in solutions of ascorbates of both inorganic and organic bases it appeared worth while to determine whether such solutions contain or develop oxalates. They do; to date we have not found any oxalate-free solution, although the extent of oxalate formation seems to vary.

The data presented here show that oxalic acid is present in the solutions in amounts from 0.19 to 11.14 mg. per cc. These quantities do not appear to be related to the concentration of the solutions because solutions of almost identical ascorbic acid concentrations, for example of monoethanolamine ascorbate, show widely varying amounts of oxalic acid. Further, the nature of the base used, inorganic or organic, seems to have little bearing on the formation of oxalic acid, as it was found that all solutions examined contained oxalates. Finally, since all solutions examined were stored in sealed, well-filled glass ampuls there is little likelihood that the oxidation of ascorbic acid to oxalic acid could be due to the effect of air but is, in all probability, due to an auto-oxidation such as referred to by Ghosh (1) and others. Some observations were made on solutions stored at 38° C. for some months instead of at room temperatures. These, for the most part, show still higher percentages of oxalic acid formed than do identical solutions held at room temperature.

It is significant that the amount of oxalic acid formed appears to be disproportionate to the amount of ascorbic acid lost by the solutions on aging. The formation of one molar equivalent of oxalic acid requires the oxidation of one molar equivalent of ascorbic acid to oxalic acid and l-threonic acid according to Ghosh and Rakshit. (2)

*From the Laboratories of E. R. Squibb & Sons, New York.

The amounts of ascorbic acid actually lost as determined by assay of the solutions when first prepared or obtained, and after aging, do not agree with the amounts of ascorbic acid lost as calculated from the oxalic acid found. This can be readily explained in the case of sodium ascorbate, somple #1, which gives low results for the amount of ascorbic acid lost by assay, because the age of this sample when obtained was unknown and it may have lost considerable amounts of ascorbic acid before it was first examined. Similarly, the same explanation can be applied to monoethanolamine ascorbate, sample #1, which also shows a smaller ascorbic acid loss than is calculated from the oxalic acid present. The results in the case of sodium ascorbate, sample #2, calcium ascorbate, and monoethanolamine ascorbate, sample #2, also show disproportionality between the observed ascorbic acid losses and those calculated from the oxalic acid findings, these being, however, in the opposite direction from those noted in the other samples. However, these discrepancies are to be expected because it has frequently been shown that there are other oxidation products of ascorbic acid besides oxalic acid and l-threonic acid and that these others are probably present to a larger extent than oxalic acid and l-threonic acid.

The formation of oxalate in solutions of monoethanolamine ascorbate as well as in those of the sodium and calcium salts is not in agreement with reports for the ethanolamine salts (4) and indicates that the latter too undergo the auto-oxidation characteristic of the former and that a change from these inorganic alkalies to the ethanolamines does not eliminate this change which might in any event be expected to be solely a function of the ascorbate radical.

The experimental data on which these conclusions are based and the method by which oxalic acid can be demonstrated in solutions of ascorbic acid and its salts are presented in the experimental portion of this discussion.

## Experimental

Five samples of solutions of ascorbic acid salts have been assayed for ascorbic acid content when first obtained or when freshly prepared. After aging, either at room temperature or at 38° C., for about one year or longer, with the exceptions noted, in sealed, well-filled glass ampuls these solutions were again assayed for ascorbic acid content and tested for oxalic acid formation. The results are presented in the following tabulation:

| Nature of the Ascorbic Acid Salt | Identity of Samples | Original Ascorbic Acid Content mg./cc. | Storage Temperature | Oxalic Acid Found mg. per cc. Solution | Ascorbic Acid Equivalent of Oxalic Acid per cc. Solution | Ascorbic Acid Loss in Storage Direct Analysis |
|---|---|---|---|---|---|---|
| Sodium Ascorbate* | Sample #1 | 51.00 | 27° C. | 1.47 | 2.87 | Not determined |
| " " | " " | " | 38° C. | 1.38 | 2.70 | 0.18 mg./cc. |
| " " | " #2 | 100.70 | 38° C. | 0.19 | 0.37 | 16.66 mg./cc. |
| Calcium Ascorbate* | | 126.6 | 27° C. | 11.14 | 21.77 | Not determined |
| Monoethanolamine Ascorbate | " #1 | 52.80 | 27° C. | 2.305 | 4.51 | 1.32 mg./cc. |
| Monoethanolamine Ascorbate | " #2 | 49.70 | 27° C. | 0.205 | 0.40 | 2.60 mg./cc. |
| Monoethanolamine Ascorbate | " " | " | 38° C. | 0.555 | 1.08 | 6.63 mg./cc. |

*Held in storage for only three months; others held nearly one year or over.

Sodium ascorbate, sample #1, and monoethanolamine ascorbate, sample #1, were market preparations and therefore of unknown age.

The oxalic acid determination is carried out as follows: 10 cc. of the ascorbic acid solution is measured by means of a pipette into a 15 cc. tapered centrifuge tube; if necessary adjust the pH to 5.0-7.5 —with the solutions described herein the pH was already within that range so adjustment was not required. Then 2 cc. of 10 per cent. calcium acetate solution are added, the empty space in the tube above the liquid is flushed out with nitrogen, and the tube is tightly stoppered. The tube and contents are allowed to stand for five days. The calcium oxalate precipitates at once, but the tube is allowed to stand for five days to insure complete precipitation. Next the stopper is removed and the tube is centrifuged for ten minutes and the supernatant liquid is decanted, care being exercised to avoid disturbing the precipitated calcium oxalate. Then the precipitate is suspended in 2 cc. of distilled water and the tube and contents are again centrifuged for ten minutes, finally decanting the supernatant liquid. This washing procedure is repeated twice more, following which the calcium oxalate is transferred to a small Gooch crucible with an asbestos mat, using as little water as possible for this purpose. This serves as a fourth and final washing of the precipitate. Then the asbestos mat and the precipitate are transferred with the aid of 25 cc. of water to a 150 cc. beaker containing 25 cc. of 20 per cent. sulfuric acid. The beaker and contents are heated to 70° C. and the oxalic acid is titrated with standardized N/100 potassium permanganate solution, 1 cc. of which is equivalent to 0.00045 gm. of oxalic acid. In some experiments the crucible and precipitate were dried and weighed. The weights were in good agreement with the amounts of calcium oxalate found by permanganate titration.

## REFERENCES

(1) Ghosh: *Jour. Indian Chem. Soc., 15,* 1 (1938).
(2) Ghosh and Rakshit: *Biochem. Zeit., 299,* 394 (1938).
(3) Maurer and Scheidt: *Biochem. Zeit., 285,* 67 (1937).
(4) Volwiler and Moore: U. S. Patent 2,132,662.

# ALCOHOL, HEALTH, LONGEVITY, AND OFFSPRING

T. Swann Harding*

ACCORDING to the *Bible,* fermented, if not distilled, liquor makes a life-promoting beverage.

In the Ninth Chapter of *Genesis,* for instance, we read something about the conduct of Noah after his retirement from the somewhat onerous fields of ship-building and deep-sea navigation, with side forays into ethnology, anthropology, and genetics. The Ark episode in his career was ended. We find that he became a husbandman and planted a vineyard.

"And he drank of the wine and was drunken." This seemed to become habitual. He thereupon would go sound asleep and lose track of everything that happened. A flight into alcoholic stupor is to be forgiven a man who once had such a superfluity of water. But we turn to the end of the Chapter and find in verse twenty-nine: "And all the days of Noah were nine hundred and fifty years; and he died."

It seems ridiculous to suggest that alcoholic beverages could have an adverse effect upon the length of the life span with this authoritative evidence to the contrary before us. I am reminded rather of a skittish young fellow well-known to me, now aged seventy-nine in years, but who goes on a "toot" every third night and complains constantly that liquor isn't what it used to be and has lost its punch.

Fermented and distilled liquors contain ethyl alcohol in varying dilutions. Alcohol is the sole potent drug they contain. Alcohol is a narcotic, not a stimulant. It lulls the so-called "organ of civilization," the cerebral cortex, into quiescence, and the drinker proceeds sans inhibition. Any stimulation that occurs is only apparent.

Alcohol is a poison. So is salt. So is water—given certain circumstances. If alcohol occurs in a liquid in such quantity that one would have to drink about half a gallon of it to absorb three ounces of the alcohol that liquid (beer) is not intoxicating. So holds Prof. Yandell Henderson, Yale physiologist.

The Volstead Law tended to exclude from use beverages which were not intoxicating. It also tended to encourage alcoholic addicts to resort to but slightly diluted alcohol in misbranded whisky, gin, or rum. Hence temperance decreased and deaths from alcoholism increased.

*Falls Church, Va.

You can die from drinking too much alcohol just as you can from eating too much food. But no poison remains poison if too greatly diluted. Many poisons are beneficial when administered moderately. Alcohol is not a very deadly poison. The important fact about a drink is not that it contains alcohol, but how much it contains.

The cumulative effects of successive drinks tend to pile up because alcohol disappears rather slowly from the blood stream. On the other hand people of acquired tolerance to it can probably oxidize it more rapidly and get rid of it. They burn it for energy. Because so easily burned the toxicity of alcohol is low.

Moreover, as the late Prof. John J. Abel of Johns Hopkins once said: "The molecule of $C_2H_5OH$ (ethyl alcohol) is not distinguished from molecules of other drugs or therapeutic agents by a distinctive and peculiar poison label."

But, as has already been indicated, alcohol is also a food. That classes it with other poisons that have food value: Copper, vitamin D, common salt, cassava, iodine and so on. Alcohol is energy-producing. It takes about 15 holes of golf to work off a pint of beer and a sweet Manhattan cocktail adds nearly 150 calories to our daily food intake.

Alcohol promotes increased storage of nitrogen and fat because it spares these foods; it also spares carbohydrates, doing their work for them. The noted pharmacologist, Dr. David I. Macht of Johns Hopkins, says that alcoholic beverages, used in moderation, have value both as food and as medicine. He quotes the *Bible* to support his statement. He holds that nicotine and caffeine, as usually consumed via tobacco and coffee, are more harmful than alcohol as consumed in beverages.

The late Graham Lusk wrote in his *Science of Nutrition:* "Taken in moderation alcoholic beverages contribute greatly to human happiness and constitute one of the solaces of mankind." Scientists have long ago called attention to the fact that abstainers from alcoholic liquors tend to overeat sweets, pastries, and confection, in compensation. Being a sugar glutton is a form of intemperance also.

Corn and wine are mentioned jointly in *Genesis;* corn, oil and wine appear bracketed together in *Joel. Ecclesiastes* goes so far as to say: "Eat thy bread with joy, and drink thy wine with a merry heart; for God now accepteth thy works."

A gram (about one-twenty-eighth of an ounce) of alcohol supplies us 7.11 calories of energy. Alcohol tends to stimulate growth

less than sugar. But drinks fatten us because a glass of beer contains 125 calories, while a glass of milk contains but 170. Since it is immediately available for energy, the alcohol spares fats already stored and carbohydrates already eaten. Three or four glasses of wine added to the meal will also step its energy content up 250 to 300 calories.

This is significant when you remember that a sedentary individual of average weight can get by on 2,500 calories or less daily. What is more, though alcoholic drinks first quell hunger they later stimulate it. This is because the hunger contractions later begin to seem more intense to us. We feel mild contractions severely and hunger results.

Therefore alcoholic drinks accentuate the hunger we feel from stomach contractions of the same intensity as before. They also produce an epigastric sensation that increases our desire for food, *i. e.*, alcohol increases appetite. This is what occurs right after cocktails, food usually being eaten quickly enough to prevent hunger arising.

But if we attend a party at which only drinks are served we are almost sure to grow hungry some hours later. This phenomenon accounts for a great deal of the icebox raiding that goes on late at night. Obviously alcoholic drinks conduce to overeating and obesity.

Do alcoholic drinks injure health? The scarred and knotted liver of the alcoholic addict is a fond memory of temperance lectures uttered long ago. In the *New England Journal of Medicine* for May 19, 1938, Dr. Timothy Leary rather lulled our fears about the dire ailments attributed to alcohol. Many of them were mythical, many were really caused by other agencies; few of them remain attributed to booze today.

Doctors do not now think that cirrhosis of the liver is "drunkard's liver" and very many "drunkard's ills" of former days are so-called no more. Dr. J. L. Bollman of the Mayo Clinic announced in 1936 that alcohol probably had no harmful effect on the liver other than making it a little fat, and this could be avoided either by drinking less than two quarts of whisky a day or by eating with the drinks.

Dr. Bollman did not believe that alcoholic drinks caused cirrhosis. Drs. Russell S. Boles and Jefferson H. Clark of Philadelphia, also in 1936, suggested abandonment of the term "alcoholic cirrhosis" because the condition occurred so often "under influences unassociated with alcohol."

There has been some dispute about this among doctors. But in general the consensus of medical opinion agrees that liver injury and the drinking of alcoholic beverages do not go together as cause and effect. This conclusion Dr. Leary accepts.

Medical opinion also holds that dipsomania or acute alcoholism are much more likely symptoms of incipient nervous or mental disorder in the person than anything else. Drinking does not produce the ills. It brings them to the surface. They were already latent in the individual.

It is no longer held that drink produces the multiple lesions of the central nervous system once attributed to it. The old-time "alcoholic neuritis" is now known to be caused by lack of the vitamin B complex. If the sufferer gets his vitamins he will recover even if not denied his booze.

Again, various types of stomach and intestinal ulcers and hemorrhages once attributed to alcohol are now said to be caused by a lack of vitamin C. The limited diet of debauchers may bring on a condition like pellagra, but the effort to live on whisky is itself absurd. In a sense the victim of alcoholism is allergic to alcohol.

Many studies indicate that excessive drinkers die from pneumonia far more readily than do moderate drinkers, and moderate drinkers are more susceptible than abstainers. So if you plan on having penumonia it is better to drink only occasionally. For alcohol seems to prevent the leucocytes from mobilizing and migrating to the point where you need them for germ-killing purposes. They remain alive and active all right but they just can't seem to get to the point where they should be battling and demolishing bacteria.

On the other hand physicians in charge of homes for chronic alcoholics often repine that the inmates show a high immunity to all infections and are more nearly immortal than any other humans. Page Noah. Among animals, alcoholized rabbits are more prone to infections than normal controls, but the reverse is true of chickens and guinea pigs.

The more acute stomach and kidney ailments cited in the menacing temperance lectures of years gone by are no longer considered to be due to boozing. The trouble was that post-mortem changes were always attributed to alcohol if the victim drank. Hence alcohol got blamed for any abnormality the drinker might manifest.

Nobody denies, however, that acute intoxication, coma, and delirium tremens can be produced by debauchery.

The possible secondary effects of intemperate drinking with undereating include: Vitamin-deficiency diseases due to the undereating; the precipitation of neuroses and psychoses that were already dormant in the drinker; vomiting, that may become fatal, given some tissue defect; the fact that certain drinks occasionally act as carriers of metallic or other poisons.

Does drinking shorten life? Page Noah again!

Raymond Pearl's studies showed that, while tobacco smoking shortened life even when indulged in moderation, and while heavy smokers perceptibly impaired their life duration, drinking had no such pronounced effects upon life expectancy. The lives of moderate drinkers were, if anything, a little longer than those of total abstainers.

But it is to be remembered that Prof. Pearl found any occupation, indoor or outdoor, that involved heavy physical exertion, greatly shortened life if continued after age 40. Furthermore certain doctors have issued warning that the habit of drinking cold water causes many deaths yearly.

Dr. Leary notes there undoubtedly has been increased mortality from alcoholism in certain sections of the United States, even since deadly "prohibition" went its way. But he attributes this to the bad habit so many formed during that prohibition era of drinking slightly diluted alcohol. Thus such deaths have increased markedly in Boston hospitals, a city where grain alcohol can be purchased freely, but not in those of New York where a prescription is required.

Economic depressions not only undermine character but also induce the impoverished to drink diluted alcohol as the cheapest way of acquiring a jag. Dr. Leary holds that alcoholism should be approached purely as a public health and never as a moral problem. More research is required so that sane legislation may be based upon it. The American Association for the Advancement of Science is already looking into that.

The moderate drinker is usually a well-balanced person who exhibits self-control and natural restraint. With or without liquor he is quite likely to outlive those emotional, impulsive, and intemperate persons who become either habitual drunkards or fanatical abstainers. The personality perhaps counts more than the liquor.

We ask finally: Does indulgence in alcoholic drinks injure the offspring of the drinkers? We turn first to birds and animals.

Back in 1917 Prof. Raymond Pearl was engaged in making alcohol sniffers out of a flock of chickens at the Maine Agricultural Ex-

periment Station. Though they constantly inhaled alcohol vapors the chickens lived as long and layed as well as normal controls. The drunkards also incontinently resisted a whole list of chicken infections that killed off most of the sober controls!

The alcoholic birds were heavier and their eggs were every bit as hatchable. Chicken fanciers found the inebriate birds far superior to the sober controls. So much for the barnyard hen and rooster in their moments of gayety and abandon.

The late Dr. Charles E. Stockard in his *Physical Basis of Personality* tells us that the exposure of rats to the fumes of alcohol acted eugenically. Fewer but far better rats were born of them. The bad "eggs" were destroyed before birth. The rat, destined by fate to lose out in life's battle, never came alive. Nor did severe alcoholism impair the health or shorten the life of rats. Their progeny grew stronger and stronger in each generation.

If these results apply to human beings the dream of eugenics will become an accomplished fact when universal drunkenness is achieved. Such things set Prof. Pearl to wondering way back in 1917 about the accuracy of the statistics from which insurance companies concluded that drinkers were bad risks. He found them of very dubious quality and then began making studies of his own.

He cited evidence from British homes for female alcoholics and chronic inebriates. Their death rate was very low—less than one-quarter that of females of their own social and economic status outside. Did alcohol also drive off their infections? What kind of children did they have?

The best research that seems ever to have been done on the influence of parental alcoholism upon human offspring appears to have been that of Karl Pearson and his associates. It was published from the Francis Galton Laboratory of National Eugenics in London, 1910.

The studies dealt with people in Edinburgh and Manchester. Very careful efforts were made to define the drink status accurately. It was concluded that alcoholism, like insanity, is probably the obvious symptom of what was in the first place inferior germ plasm.

Therefore the offspring of alcoholics may be inferior, not because of the inebriety of their parents, but because their whole biological line is inferior. Aside from this, parental alcoholism may be socially, economically, or morally bad for the children because of family and home disintegration.

It seemed possible also, on the other hand, that only the more virile individuals would drink much. In that case it might spuriously appear that parental alcoholism produced good physique in offspring. Again, if only stupid adults became drunkards, then it might spuriously appear that parental alcoholism injured children's minds.

Allowing for all these possibilities the study went on. The parent's wages were used to indicate economic status. It was assumed that the drinkers would earn less than the sober workers, but the difference was only about a quarter a week in favor of the latter and hence was negligible.

A higher death rate was found among the offspring of drinking than of abstaining parents. But the much greater fertility of the drinkers was said to atone for this. The crude mean weight and height of the children of drinkers were superior to those of the sober; after correction for age there was no difference.

The children of the drinkers had better health than those of non-drinkers. This was quite generally true. There were fewer delicate individuals among them. Tuberculosis and epilepsy were also less common. The high death rate left fitter survivors; the alcohol acted eugenically, it appeared.

It was finally concluded that parental alcoholism had no adverse effect upon offspring, physical or mental. It was admitted that alcoholism offered a serious economic and social problem. It is usually associated with home disruption, desertion of the wife, non-support, necessity for maternal employment and so on.

But definite, final conclusions cannot be drawn. It seems very likely that alcoholism is merely the outword and visible mark of some abnormal cross-hereditary factor.

*Alcohol and Man, the Effects of Alcohol on Man in Health and Disease,* edited by Haven Emerson, M. D., is a typical symposium on this subject. The contributors are experts. We learn from it that, by selective documentation, it could be "proved" either that total abstinence or that moderate use of alcoholic beverages was beneficial. The only general agreement runs to the effect that the "immoderate" use or the "abuse" of alcohol is bad.

Where abuse begins no one knows. It is largely an individual matter. Fortunately the Research Council on Problems of Alcohol, composed of scientists, is ready now to study this problem seriously. Psychiatrists, biochemists, physicians, penologists, social scientists,

economists, physiologists, pharmacologists, bacteriologists, and educators will try their hand where moralists have failed signally.

This will be the first strictly scientific study by fully qualified authorities that has been made. It should teach us much about the control of alcoholic beverages through a program of unbiased research and education.

For neither prohibition nor the present system is exactly satisfactory. Excesses and abuses remain uncurbed. Alcoholism and highway accidents form a sinister combination. But the emotional and political barriers that have stood in the way of calm approach to the problem must be torn down. The plain facts must be sought.

We want definitely to know all we can learn about the effects of alcohol upon the individual and upon society, and about the relative effectiveness of various measures of industrial and legal control when viewed dispassionately. The abuse of anything can lead to trouble, and that goes for pepper, vinegar, baths, food, milk, and egg custards.

Moderate amounts of certain alcoholic beverages appear to offer a valuable form of psychological relaxation and relief from nerve tension to certain individuals. For the well-balanced, well-integrated individual, the benefits of drinking moderately outbalance the ill effects. But such persons would not even try to work, drive a car, or dispute with their wives while mildly "under the influence."

That alcohol, like phenolphthalein, cinchophen, thyroxin, sulphanilamide, aspirin, acetanilid, the barbituric acid derivatives, and many other drugs to which we Americans are daily exposed, is a poison no one can deny. But it is just about as easy to impair health and shorten life by gluttony as by drunkenness. The individual must meanwhile seek intelligently to learn what is best for him and to act accordingly.

# REPRINTED ARTICLE

## WHY A HOSPITAL PHARMACY?*

By Hazel E. Landeen [1]

THE RESULT of a survey of the hospitals in this country showed that drug therapy in the majority of hospitals is in confusion and greatly in need of revision. So it is hoped that a brief review of the recommendations of the Pharmacy Committee of the American Hospital Association and those of the American College of Surgeons together with a few observations by a hospital pharmacist will serve to emphasize the need for a more adequate pharmaceutical service.

### Drug Therapy in Hospitals

Drug therapy still holds an important place in the hospital despite the rapid advances in surgery, physical therapy, and other methods of treating the sick. Dr. MacEachern, in an article appearing in the February issue of *The Modern Hospital,* has called the pharmacy "The Forgotten Department." One of the reasons the pharmacy has been forgotten and lagged behind is because hospital pharmacists have not been organized, and, therefore, unable to keep pace with the other departments of the hospital in rendering the best in professional and scientific service. Unorganized, we could not be the aggressors and offer this better and more comprehensive service.

It seems to us a rather sad situation where a law safeguards the sick as long as they are able to keep out of the hospital, by requiring that public pharmacies be registered, controlled, and inspected under the regulations of the State's law and that the pharmacists who serve in these pharmacies be satisfactorily, adequately and thoroughly educated in pharmacy, and licensed to dispense. But let the patient enter a hospital and the law in effect says to him, that the pharmaceutical protection afforded him up to that time is withdrawn.

### The Hospital Pharmacist

Fortunately, for hospital pharmacy, a group of men interested in doing something for that branch of our profession took the initial

*Reprinted from *Hospitals,* August, 1939.

[1] Pharmacist, St. Luke's Hospital, St. Paul, Minn.

step toward its organization. There was formed in 1936 at the Dallas meeting of the American Pharmaceutical Association the sub-section on hospital pharmacy under the section on Practical Pharmacy and Dispensing. The American Pharmaceutical Association, founded in 1852, is the oldest and most representative pharmaceutical organization in the United States. It has always recognized that the future of pharmacy depended upon its unqualified recognition as one of the health sciences as well as upon the professional services rendered by its practitioners to the public. The primary objective of the Association is the extension of usefulness of the pharmacist to his community and the preservation of all that is ethical in the profession. Through its organization in the American Pharmaceutical Association, the Hospital Pharmacy sub-section was able to present its problems to the American Hospital Association and American Medical Association from a standpoint of a sound basic pharmaceutical service. Working with the Committee on Pharmacy of the American Hospital Association a survey of the pharmacies of the Nation's hospitals was made. The sister organizations of the American Hospital Association, the Catholic and Protestant groups, have been in conference with the American Pharmaceutical Association and in line with the activities of the American College of Surgeons are endeavoring to present a clear picture of the value of commensurate pharmacy operation to those hospitals at present struggling along without it.

Last year the registered hospitals of the United States admitted more than 9,200,000 bed patients and approximately ten million out-patients. The former stayed a total of 344,700,000 days while 25,000,000 visits to out-patient departments were made by the latter. The number of registered hospitals in 1936 was 6,189. Of this number, 1,419 employed 1,901 pharmacists. This leaves a large majority without a pharmacist and adequate pharmaceutical service. In the interests of public health and safety of the people, each and every hospital should have registered pharmaceutical supervision.

I cannot do more than refer you to that most complete report of the Pharmaceutical Committee of the American Hospital Association of 1937. As one writer stated—not even the *Readers Digest* could condense it. This report deals with the physical aspects of the pharmacy, projects a philosophy of pharmaceutical service and economics, and outlines and stresses the duties and responsibilities of the pharmacist.

## Hospital Pharmacy Standards

The American College of Surgeons, in cooperation with a committee of the American Pharmaceutical Association, formulated the essentials for an ethical and efficient pharmacy department. The American College of Surgeons expects approved hospitals to comply with its Minimum Standards Requirements. These appear in the latest manual on Hospital Standardization. Briefly these standards require that a hospital provide:

1. Organization of a hospital pharmacy
2. Committee on Drug policy and therapeutics of which the pharmacist shall be the secretary
3. An adequate pharmaceutical reference library
4. Maintain standard quality drugs, chemicals, and pharmaceutical preparations used in treatment of the sick
5. Supervision by the pharmacist of routine preparation of injectible medication and sterilization of all preparations he himself prepares, routine manufacture, filling and labelling of all drug-containers and semi-monthly inspection of all drugs on nursing units, stock of antidotes, dispensing of all narcotics and perpetual inventory of them, specifications for purchase of all drugs, chemicals, etc.

The reasons for all this, are, of course, obvious to every hospital pharmacist. We feel that many hospital administrators have overlooked the possibilities of the pharmacy. While the pharmacist does not have the active and intimate contact with the patients that nurses, interns, anesthetists, and dietitians have, is it not possible that the professional and intelligent attitude of the pharmacist behind the scenes may have an important bearing on the success of these other workers in the front line?

## Evaluating the Pharmacist's Service

To many persons the word pharmacist means merely some one who fills prescriptions. Every hospital superintendent will do well to consider the services of the pharmacist from three standpoints, namely:

1. Safety
2. Education
3. Economy

Taking the first viewpoint: that of safety: the pharmacist in his role as compounder of the physician's orders or prescriptions must exercise extreme care and skill to obtain the accuracy necessary in medications dispensed to the sick. He is constantly handling extremely potent and poisonous drugs and chemicals and handling them in doses that require knowledge and clear thinking.

Graduation from a four-year course in an approved school of pharmacy, plus an extra year's apprenticeship in a pharmacy before a candidate is eligible for State Board examinations and subsequent licensing is a guarantee of safety afforded the hospital employing a pharmacist. In this connection the question of safety may well be considered from the third angle—that of economy, in that employment of a registered pharmacist safeguards the patient, eliminates errors and protects the hospital against suits for such errors.

In respect to education: pharmacy schools are turning out well-educated graduates, thoroughly professional in character and attitude. So important is hospital pharmacy becoming that many pharmacy educators are advocating a hospital internship for some of their graduates. Such a system is already in operation in the University of Michigan Hospital (1). The background and education of the pharmacist has other values besides compounding of prescriptions. The hospital pharmacist can assist in the education of the young intern, particularly in the matter of prescription writing, a subject about which the average medical graduate knows very little. Materia medica, a subject which nearly every student nurse finds so difficult to grasp, could be taught by the pharmacist who has been thoroughly grounded in this subject. The pharmacist can advise helpfully with the medical staff on the selection of prescriptions and can act as a source of information and reference on new drugs. With his knowledge of the intelligent purchase of drugs and familiarity with sick room needs and supplies, the pharmacist makes a very satisfactory purchasing agent. This combination may prove of interest to smaller hospitals.

With all the agitation for more and better hospitalization at lower cost the matter of economy is one which no hospital administrator overlooks. Irrational therapeutics and lack of a definite drug scope eat up hospital dollars quite avariciously. With his knowledge of the standard requirements and composition of drugs and

[1] Hospital Pharmacy internships also, now being offered by Western Reserve University Hospital, Cleveland, and Johns Hopkins Hospital, Baltimore.

chemicals the pharmacist can effect a material saving. The extent to which a hospital pharmacist should manufacture depends naturally on the size of the hospital, equipment and personnel requirements. But even in the small hospital there are a certain number of items which can be manufactured at a considerable saving. In one hospital in which I was employed the pharmacist made the furniture polish. In one of our own State institutions the pharmacist manufactures the tooth powder. Working with the therapeutics committee of the hospital, the pharmacist can help eliminate duplication of large numbers of drugs having identical therapeutic action, and thus reduce the number carried in inventory.

Hospitals are dedicated to a policy of rendering the best in scientific and professional skill in the treatment of the sick. Competent pharmaceutical service in the hospital has been overlooked by too great a number of hospital administrators. The American Hospital Association Committee on Pharmacy, the American College of Surgeons and the sub-section on Hospital Pharmacy of the American Pharmaceutical Association are convinced that a rational policy of drug therapy is not possible in any hospital without a graduate registered pharmacist's supervision.

## REFERENCES

"The Forgotten Department," *Modern Hospital,* Feb., 1939—Dr. MacEachern.

"The Function and Scope of Hospital Pharmacies," *Hospitals,* Dec., 1938—Dr. Lewis Jarrett.

"To What Extent Should Hospital Pharmacists Manufacture?" *Hospitals,* Feb., 1939—J. Solon Mordell.

# ABSTRACTS OF SELECTED PAPERS PRESENTED AT THE ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL CONVENTION
## August 20-26, 1939

**A Rapid Procedure for the Manufacture of Saponated Solution of Cresol.** L. F. Martin and W. A. Prout. The authors suggested that Saponated Solution of Cresol be manufactured directly from the cresol and an already prepared soap such as sodium stearate or sodium oleate rather than by the older method of making the soap within the solution.

The many advantages of the new procedure are: The period of time consumed in manufacturing is shortened considerably; the use of two alkalies is eliminated; the prolonged heating necessary to complete the reaction of the oil and alkalies is thus insuring the proper control of cresol as well as preventing the dark color often produced.

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**Pastes for Dermatologic Use.** B. Fantus and H. A. Dyniewicz. The dictionary defines paste as "a compound in which a sufficient amount of moisture is present to make a mass without liquefying." The authors have derived from this meaning the pharmaceutical definition of a paste as "a gel for medical use."

The title "Paste of Zinc Oxide" when considered within the pharmaceutical definition in mind is confusing. For this reason it has been suggested that it be changed to "Dense Ointment of Zinc Oxide."

The action of pastes in preventing surfaces from drying thus allowing cells to poliferate, causes these preparations to be used extensively in treating bed sores and ulcers. Elaborated formulas (according to the type and condition of the ulcer) of the following were used at Cook County Hospital, Chicago: Dense Pectin Paste, Thin Pectin Paste, Tragacanth Paste, Zinc Peroxide Paste, Carbamide Paste, Ethyl Aminobenzoate Paste, Sulfanilamide Paste, Cuticolor Tragacanth Paste, Cuticolor Bentonite Paste, Cuticolor Tragacanth Covering and Cuticolor Bentonite Covering.

The paste treatment not only furnishes effective relief and facilitates healing but introduces the economy factor as well, requiring only 3.2 hours of nursing as compared with 25.6 hours necessary with other methods of treatment. The cost of supplies for the paste treatment is $30.86 as compared with an average of $74 for other

methods. The shortening of the hospitalization time is an important factor.

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**The Pharmacognosy of the Parathyroid.** H. W. Youngken. In comparing powdered desiccated parathyroid and thyroid the author states that while both contain connective tissue, the former is distinguished by the presence of but a very small amount of colloid and numerous tissue fragments bristling with reticular fibers. The colloid material may not be seen in every mount.

To differentiate the two drugs qualitatively a chemical color test may be made on a white porcelain surface by treating 5 mg. of each powered drug with 2-3 drops of vanillin solution (5 per cent. in alcohol) and concentrated hydrochloric acid. Desiccated thyroid turns brown with this reagent whereas a pinkish-brown color changing later to pink is assumed by the desiccated, powdered parathyroid.

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**The Determination of Acetone.** M. W. Green. At present three general methods for the quantitative determination of acetone are recognized: (1) Official (U. S. P.) method of converting the acetone to iodoform; (2) precipitation of an acetone-mercury complex; (3) formation of acetoxine from excess hydroxylamine.

A comparison of the methods showed that the second method was exceedingly variable and a 100 per cent. yield could not be obtained with the oxine (3) method. Although the figures obtained by the official method were slightly high, the most reliable and uniform results were obtained with this procedure. A secondary reaction such as the production of a formate (involving ten rather than six atoms of iodine) is the probable cause of the high results. The reduction of bichloride of mercury to calomel by the mixture proved the presence of a formate.

**The Detection of Carbon Monoxide in Medicinal Oxygen.** F. K. Bell and J. C. Krantz, Jr. To a liter of the medicinal oxygen to be tested were added 50 cc. of nitrogen, the mixture then being treated with an alkaline solution of sodium hydrosulfite. The gas volume remaining after the almost complete absorption of the oxygen is diluted with nitrogen to 100 cc. This 100 cc. sample is treated by the standard blood-pyrotannic acid method. A liter sample of carbon monoxide-free oxygen is completely treated in the same manner to serve as a standard control. The standard blood-pyrotannic mixture will show a gray-brown color whereas the presence of five

parts per million of carbon monoxide in medicinal oxygen will impart a pinkish tint to the mixture.

**Iodocholeate—Its Efficiency as a Germicide and Its Clinical Performance.** H. R. Scherzer. Despite the fact that the germicidal efficiency of all iodine solutions is decreased by the presence of organic matter "Iodocholeate," the new bile-iodine germicide, has been proven to have approximately three times greater bactericidal powers against *Staphylococcus Aureus* than ordinary solutions of iodine under the same conditions.

Iodocholeate possesses an exceptionally low surface tension and high penetrating power. Its solutions are particularly adopted for impregnation of gauze pads. Differing from inorganic iodine, it remains stable on the gauze pads, is non-volatile, does not destroy gauze cloth fibers and when covered is neither corrosive nor irritating.

Powders for wounds and ointments containing this compound have shown a definite bactericidal action.

Toxocologic evaluation of the compound showed no harmful effects on rabbits when an oral dose of 2 cc. of the undiluted solution per one pound of body weight was administered.

**The Pharmacology of Soaps. II. The Irritant Action on Human Skin.** B. E. Emery and L. D. Edwards. Most workers in testing the irritant action of soaps on human skin use the patch test method (impregnating the soap on gauze and binding the gauze to the skin).

The authors found this method unsatisfactory for their work. They presented the following modification: A pessary with the rim oiled is filled with the solution and placed on the arm so as not to spill the liquid. The whole is held to the skin by rubber matting and adhesive. This method has the advantage of keeping the solution in contact with the skin at all times.

Employing this method the irritant actions of the potassium and sodium soap solutions of nine pure fatty acids were studied. Percentage solutions of such soaps are inadvisable, molar solutions being preferred in comparison tests. In this investigation .0225 molar solutions were used. After four hours of contact with the skin a decided irritation was found in both male and female subjects.

Those subjects who exhibited pain, itching or redness two hours after removal of the liquid were considered positive. If the irrita-

tion disappeared upon removing the liquid the results were considered plus-minus.

In all cases lauric acid soaps were found to cause the most irritation with myristic acid soaps second. Sodium aliphatic soaps were less irritating than the corresponding potassium soaps. As was generally expected the percentage of female subjects affected was greater than the male.

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**Studies on Cantharidin. I. The Titration of Cantharidin.** B. P. Hecht and L. M. Parks. An attempt was made to improve the unsatisfactory official method of assaying cantharides. The quantitative titration of cantharidin has been investigated with a view of applying this method to the evaluation of the crude drug. The failure of numerous workers to titrate cantharidin in the presence of such solvents as alcohol, acetone, and benzene were confirmed. This fact was explained by the authors as due to a depression of the ionization of cantharidin. To overcome this the authors describe a method in which the organic solvent used to dissolve the cantharidin is completely removed during the procedure in the presence of water and excess alkali. The method was found to produce equally satisfactory methods for cantharidin and other water insoluble acid anhydrides.

II. The Assay of Cantharides. The application of the above method to the drug gave results somewhat higher than the U. S. P. method but it is less tedious and time consuming. A study of the different phases of the official assay method has shown that the solvent of benzene and petroleum ether is satisfactory for the complete extraction of cantharidin. Chloroform was also shown to extract it completely but alcohol was unsatisfactory. Attempts to improve the way in which fats and inert material are removed from the extracted residue were unsuccessful. The authors suggest further investigation of the titrimetric method for both the drug and tincture.

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**The Absorption and Toxicity of Sodium or Potassium Sulfocyanate.** R. C. Anderson and K. K. Chen. In view of the renewed interest in sulfocyanates for the clinical management of hypertension, it was felt desirable to strengthen the pharmacological data heretofore available. Both sodium and potassium sulfocyanates were employed. By means of a photelometer, blood concentrations could be determined after absorption with 0.1 cc. of blood. In rabbits, sodium sulfocyanate in the dose of 100 mgm. per kgm. when given

by mouth remained in circulation for approximately forty-eight hours, and in the dose of 200 mgm. per kgm., it disappeared in about ninety-six hours. Potassium sulfocyanate in the majority of experiments showed a tendency to stay in the blood stream for a longer time than the sodium salt. In dogs receiving *per os* either sodium or potassium sulfocyanate in the amount of 50 to 100 mgm. per Kg., complete elimination occurred at the end of forty-eight hours. Regarding the toxicity, the median lethal dose of sodium sulfocyanate when injected intravenously in mice was found to be 483.6 mgm. per Kg., that by mouth in mice 598.2 mgm. per Kg., and that by mouth in rats 765 mgm. per Kg. The median lethal dose of potassium sulfocyanate when injected intravenously in mice was determined to be 88.2 mgm. per Kg. that by mouth in mice 594.4 mgm. per Kg., and that by mouth in rats 853.7 mgm. per Kg. Prolonged administration of either salt in doses varying from 50 to 100 mgm. per Kg. in rats and dogs did not result in apparent injury to the animals.

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**Water in Oil Emulsifying Agents.** J. L. Powers, H. B. Leask and R. S. Warner. An investigation was undertaken to determine the constituent or constituents of lanolin responsible for its property of emulsifying water in petrolatum. It was hoped that a suitable water absorbent base might be developed.

Anhydrous lanolin was saponified, and the unsaponifiable portion was resolved into four fractions, cholesterol, a mixture of polycyclic alcohols usually designated as "isolcholesterol," a mixture of alipathic alcohols consisting chiefly of ceryl alcohol, and an amorphous mixture from which no crystalline material could be separated. The water absorbent power of these various fractions in different concentrations in white petrolatum was determined. Similar data in connection with other polycyclic alcohols such as the amyrins and aliphatic alcohols such as cetyl alcohol were obtained. Some esters of the various alcohols were prepared and similarly tested.

It has been found that no single fraction of the unsaponifiable portion of wool fat is entirely responsible for its emulsifying action upon water. For example, it was determined that whereas a mixture consisting of 4 per cent. cholesterol and 96 per cent. petrolatum will emulsify 1½ times its weight of water, a mixture consisting of 4 per cent. cholesterol, 4 per cent. cholesterol palmitate, and 92 per cent. white petrolatum will emulsify eight times its weight of water.

Mixtures of cholesterol palmitate and petrolatum will emulsify no appreciable quantity of water.

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## Colchicine in A New Role

Bigger and better cotton, tobacco, berries and fruits, with new chemical-created heredities, are about to result from U. S. Department of Agriculture research through use of the old-fashioned gout and rheumatism remedy, colchicine, in the most promising plant breeding experiments in years.

Fertile hybrids of economically important plants are being produced, successful plant crosses heretofore impossible are being achieved.

From pioneering experiments by Dr. Albert F. Blakeslee, Carnegie Institution geneticist, several years ago, the application of colchicine, extracted from seeds of the wild meadow saffron and used sometimes as a gout remedy, promises to give farmers better plants to grow in their fields. (See *S. N. L.*, Jan. 22, 1938.)

The drug causes rapidly growing young plants to double the number of chromosomes in their cells, juggling the heredity in such a way that the new plant created breeds true and is not sterile as are most hybrids. Chromosomes are the carriers of heredity within the cells and seeds.

Crossing of valuable Sea Island cotton of the Asiatic variety and American upland cotton is being undertaken by Dr. J. O. Beasley of the Bureau of Plant Industry, working in North Carolina.

For the first generation this cotton cross produces a form which gives the typical long fibers of Sea Island cotton with the early maturity of the American upland cotton. This hybrid, however, while fertile, goes to pieces after the first generation cross and loses its desirable qualities.

The drug colchicine, by doubling the number of chromosomes in the cells of the plant, allows the production of a fertile hybrid of the cotton that will breed true.

To get a true-breeding strain depends on a freak of nature found commonly in Sea Island and at times in upland cotton. It is a twin embryo. Usually one of the embryos produces a shoot with only half the number of chromosomes in one set instead of the regular two sets required for fertility. By doubling the chromosome number of this shoot with colchicine, the scientists hope to get a pure-line cotton with two sets of identical chromosomes which should breed true.

Dr. H. H. Smith at the Arlington, Va., U. S. Department of Agriculture Experimental Farm has obtained similar results with hybrid tobacco which, in some forms, has great value as an insecticide. This is especially true of wild tobacco of which one type contains nornicotine, an alkaloid related to nicotine but much more potent in killing insects.

Drs. Haig Dermen and G. M. Darrow, working at Beltsville, Md., have tried colchicine on berries and fruit trees and hope to produce a permanently reproducing cross between Loganberries and ordinary blackberries. Crossing of red raspberries with other berries is expected to yield a variety that will grow in warm southern climates.

The work with peaches has only just been done. What its results will be cannot yet be determined because it will take a year or two to obtain fruit from the trees.

Treating a young seedling or a growing shoot of a plant with colchicine often results in doubling the number of chromosomes. When the drug is applied as a weak solution, normal cell division is halted. Ordinarily the chromosomes split and the same number of chromosomes pass to the two daughter cells. The drug destroys the mechanism which normally causes the two sets of chromosomes to pass into the two daughter cells. In such a state, the chromosomes split although the cell division is not completed. When removed from the solution the cell again starts normal division in which the chromosomes split again to give the new cells twice the number of chromosomes.

This doubling of chromosomes has, where successful, resulted in making sterile hybrids fertile. As an example, Asiatic cotton has two sets of 13 chromosomes. American upland has two sets of 26 chromosomes. A cross between the two has one set of 13 chromosomes from the Asiatic and one set of 26 from the upland, or a total of 39 chromosomes. Such a hybrid has two good reasons for being infertile. In the first place the chromosomes from the Asiatic are not sufficient in number to pair with those of the upland. The behavior of unpaired chromosomes in dividing cells is irregular. In the second place a 39-chromosome plant cannot distribute 39 chromosomes equally to form reproduction cells.

By doubling the chromosome number with colchicine this hybrid then has 78 chromosomes or two times 39. It has two sets of 13 and two sets of 26, or the same number as both parents. In this way each chromosome is provided with a mate from its own set thereby restoring regularity of chromosome distribution—*Science News.*

# SOLID EXTRACTS

By Ivor Griffith, Ph. M., Sc. D.

**Despite the form in which this information is presented it may be accepted as trustworthy and up-to-date. Original sources are not listed but they may be obtained upon request.**

Again comes evidence that the ancients knew much of what we of this generation proudly announce as brand-new findings. For instance, selenium poisoning in live stock was latterly given out as a novel discovery. But the first written record of selenium poisoning was made by Marco Polo in western China about 650 years ago—though of course he didn't know what it was. He only noticed "a poisonous plant growing there, which if eaten . . . has the effect of causing the hoofs of the animals to drop off. Those of the country, however, being aware of its dangerous quality, take care to avoid it."

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*Modern medical science is making rapid progress in spite of handicaps of premature propaganda and unripe conclusions. And so many of its findings bring a new interest and perhaps new clues to old-fashioned medical practices. An old gout remedy, colchicine, from the autumn crocus, arrests cell growth and recent research indicates that the growth of certain mouse cancers can be checked by this drug. Certain sulfur compounds have been found to have a definite growth-checking effect on breast cancers of mice.*

*Iso-valeric acid is found to be a component of vitamin B complex, which may explain how valeric acid compounds (valerates, and the drug valerian itself) have long since been established in therapy.*

*Few persons knew that benzyl benzoate, heralded as a "new" antispasmodic, was present in the old syrup of tolu.*

*Before we know it the old-fashioned herbs of the country side will be having the backing of the Harvard medical school.*

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Here is another item along the same line.

Experiments with an old-fashioned remedy which has long been discarded as of no particular value showed it to be capable of relaxing cramps in certain of the body organs, it was brought out in a report by Dean Bliss, of Howard College School of Pharmacy.

The drug is *Potentilla anserina.* It grows as a common weed everywhere. Experiments on animals brought out its almost forgotten value.

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*Pioneer great-grandmother's "spring greens," made from all sorts of wayside weeds, were better than spinach when it came to providing vitamin C, it appears from a study reported* (Science, *August 18*) *by Prof. R. C. Burrell and Miss Helena A. Miller, of Ohio State University.*

*Professor Burrell and Miss Miller analyzed fifteen kinds of weeds that have been used in cooked greens and salads, and found that most of them are superior to fresh spinach. Milkweed topped the list by far, with 6.556 milligrams of ascorbic acid per gram of fresh weight. Spinach averaged only 0.812 milligrams per gram, in comparison.*

*Other high scorers included pokeweed, dandelion, watercress, sorrel, and (of all things!) skunk cabbage.*

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Leadership in chemistry throughout the world is now in possession of the United States, it is disclosed in a report submitted to the American Chemical Society by Prof. E. J. Crane of Ohio State University, editor of *Chemical Abstracts.*

Germany, which ranked first during the World War period and even a decade ago, has now dropped to third place, with Great Britain second. Russia and Japan show striking gains, Professor Crane reports.

English is predominantly the language of science, the United States and England accounting for 40 per cent. of all scientific periodicals published.

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*Patients suffering from more than one serious ailment in which there is danger of fatal bleeding can be saved by treatment with the anti-bleeding vitamin K. This increased usefulness of the vitamin appears in a recent report by the Mayo Clinic.*

*Liver disorder or injury, intestinal obstruction following operations for cancer or other conditions, chronic ulcerative colitis, and other severe intestinal disturbances are among the conditions in which the vitamin may be valuable in preventing or controlling bleeding. The vitamin, of course, has no effect on the ailments themselves, but*

*only on the tendency to hemorrhage, which may be a serious complication in such conditions.*

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Low ragweed, one of the most evil of American hay fever plants, is abundant in Japan but apparently causes no sneezes.

Although ragweed has been in Japan for many years, nobody has ever paid much attention to it because it has caused little trouble. Learning of its ill repute in America, Mr. Katsura, a graduate student at the University of Maryland, sent home for some of its flowers and had the pollen tested by an American pollen specialist, Dr. R. P. Wodehouse of Yonkers, N. Y. Dr. Wodehouse reports that the pollen produced typical reaction in sensitive persons.

Mr. Katsura states that Japan is a land of no hay fever. He has known only one Japanese hay fever victim, a woman scientist who became sensitized to poplar pollen during a sojourn in England. After her return to Japan she continued to have attacks every spring, but when a poplar tree that grew in her neighborhood was cut down the attacks ceased.

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*Both coffee and tobacco contain tars which can cause cancer, Dr. Angel H. Roffo, of Buenos Aires, Argentina, has found. Some of the tars he extracted from tobacco caused cancer when painted on rabbits' skins in 100 per cent. of the animals. Most active cancer-causing tars were obtained from Turkish, Egyptian, Kentucky and twist tobaccos. Tars of tobaccos from Havana, Italy, Paraguay, Germany and Salta were not so active, but even these caused cancer in more than 50 per cent. of the animals treated. Dr. Roffo estimates that the average smoker in ten years applies more than eight quarts of tobacco tar to the tissues lining his breathing apparatus.*

*Coffee drinkers need not fear getting cancer, Dr. Roffo reassures us, because the cancer-causing substances in coffee tar do not dissolve in water and so cannot get at human tissues to damage them.*

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A new method for gauging the quantity of vitamin $B_1$ in any given food sample is announced by Drs. Gilberto G. Villela and Aluisio M. Leal of the Oswaldo Cruz Institute, Rio de Janeiro, Brazil.

A water extract is made of the food to be analyzed. The solution is acidified, and ammonium molybdate is added. In the presence of

vitamin $B_1$ an intense blue color blazes up. Gauging the intensity of this color by means of a suitable instrument gives a measure of the quantity of the vitamin present.

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*The pneumonia death rate in Norway has been cut three-fourths or more by the use of the new chemical remedy, sulfapyridine, the Oslo correspondent of the American Medical Association reports* (A. M. A. Journal, *Sept. 2*). *Serum treatment of pneumonia was never very popular in Norway, chiefly because of the frequently great distances between the patient and a laboratory where typing of the pneumonia germs could be done. This disadvantage does not hold for sulfapyridine, which is apparently being widely used. Records from various hospitals show that among 342 uncomplicated cases treated with this new drug, there were only 20 deaths, giving a death rate of 5.8 per cent. contrasted with a rate from 20.5 to 35.2 per cent. in the pre-sulfapyridine period of 1928-1938.*

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Muscle oil, contour cream, skin food, rejuvenating cream, hair color restorer and hair grower are among the terms formerly seen on labels of cosmetics which are now banned by the new laws governing foods, drugs and cosmetics. Commenting on the list of banned terms recently issued to manufacturers by the Federal authorities, the editor of the American Medical Association calls special attention to the term "nonallergic" now also banned by Federal law. The term is considered misleading because, while cosmetic products may be and are made without such ingredients as orris, to which many persons are allergic, even the simplest preparation may be allergenic to susceptible persons. The problem of allergy was one of the first attacked by an A. M. A. committee appointed, before the new Federal laws were passed, to advise the Journal of the A. M. A. concerning cosmetic products advertised in its pages.

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*The fertility vitamin E may come to the aid of patients suffering from muscular dystrophy, an ailment of muscular weakness and wast-*

*ing, it appears from investigations by Drs. Nobuko Shimotori, Gladys A. Emerson and Herbert M. Evans of the University of California.*

*Guinea pigs that suffered from this condition as a result of a faulty diet were helped by the fertility vitamin, the California investigators have reported* (Science, *July 28*).

*"Human use of vitamin E has not yet been accomplished," Dr. Evans, discoverer of this vitamin, replied to an inquiry.*

*He did not say, however, that the vitamin would not be tried on human patients. The vitamin is found most abundantly in wheat germ, and is available in pure form as alpha tocopherol.*

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The behavior of the ameba, the microscopic animal which not only moves and avoids obstacles but also can choose between edible and non-edible objects, is not "conscious."

It is possible to duplicate practically all of the activities of an ameba with nonliving mechanical models. Ameboid movements are produced by injecting a little alcohol into a droplet of clove oil in water. The alcohol changes the surface film of the oil droplet and causes it to send out "pseudopods" and to flow about like an ameba.

A drop of chloroform in water appears to be quite as "finicky" in its "eating habits" as an ameba. When offered small pieces of various substances, such a drop will "refuse" sand, wood, and glass and will even eject them if they are forcibly introduced. On the other hand bits of shellac or paraffin are "eagerly" enveloped.

If we play a trick on the chloroform drop by feeding it a piece of glass coated with shellac, it will engulf this "delicacy," dissolve the shellac, and then eliminate the glass.

These experiments suggest that much of the mystery which some writers attribute to the behavior of the living ameba might be explained if we knew enough about the purely physical phenomena involved.

# BOOK REVIEW

**Lobscows.** By Ivor Griffith. International Printing Company. 548 pages. $3.00.

The Greeks *may* have had a word for it, but it escapes us at the moment. However, the Welsh have a word for it, and it is "Lobscows." The Americans have a term for it, too,—"Clean up the kitchen." In other words, a potpourri, a conglomeration, an assemblage of the better things is presented here, resulting in a product highly pleasing to the senses. Except that where the foregoing terms apply to the culinary art, the title under consideration applies to the epistolary art, the book being a compendium of the literary and alliterative masterpieces of popular science from the pen of the Dean of Pharmacy of the Philadelphia College of Pharmacy and Science. Incidentally, the Hollywood name for it would be "Colossal."

Those who know the author will expect, receive, recognize and appreciate certain characteristics and welcome trends in subject matter and style of presentation. Those who are unfamiliar with the writer will be most pleasantly surprised with the novel way in which ostensibly "dry" subjects such as tobacco, fur, cosmetics, poisons, blood, colloids, history and many others are treated. Many of the chapters are the author's popular science lectures irremovably and fortunately placed in print. Some of his most pertinent and thought-provoking American Journal of Pharmacy editorials appear in this volume, and it is surprising to note how they reflect the true picture of pharmacy and science and the healing arts in today's world.

A chapter of Science Snacks contains a half-hundred pages of pithy paragraphs in true Griffith manner, running the gamut of topics from anaesthetics, anemia and allergy, bacteria, brains and Bronx cheers, to Wales, water purification and weird Chinese drugs. A grouping of poems indicates the far from gloomy Dean's proficiency along these lines, and delicately reveals his reverences and his reveries. A final chapter, entitled Ex-Libris, reproduces some of the author's inimitable pen and ink sketches appearing upon and illustrating the title pages of the more famous books in his home collection.

For pleasant, informative reading, for highly satisfactory giving to others who like to read and who are interested in the sciences, "Lobscows" has our recommendation without equivocation.

JOHN E. KRAMER.